DISCUSSIONS

WATER RATES[1]

The authors evidently had some trouble in classifying output or capacity charge. This capacity charge has been a stumbling block before. The term comes from the electric light business, and, in the electric light business, the capacity charge seems to be an item of vital interest. In the water works business it is not nearly as important. Water takers have very regular habits, and the maximum drafts occur at well determined times, and, within limits, they can be easily met by any properly equipped water works system.

The highest peak load, as Mr. Fenkell has shown from Detroit experience,[2] is only from 50 to 75 per cent above the average. This, of course, is exclusive of fire drafts. Fire drafts are generally large, and the works have to be built to meet them. The ordinary drafts are much less than the fire drafts, and the capacity factor is not really so very important in the water supply business.

It has seemed to me that the cost of service could be classified more helpfully and with much less complication by a slight change in the procedure.

The whole cost of service may be divided into three parts. The first part is the *service cost* and includes all the costs of the connections and meters and bookkeeping and collecting; and this cost for the whole system should equal the sum of the service charges, and should be met by them.

The second part is the *cost of water*. That represents the whole cost of the water up to the point where it goes into the distribution system under pressure. That cost can be figured at so much per thousand gallons and this cost of water forms the first element in the meter schedule.

The third part of the cost is all that remains and this may be called the *cost of distribution*. This cost of distribution includes practically the whole of the cost of the fire service, and whatever receipts there may be for fire service should be credited to this account. The remainder

[1] JOURNAL, September, 1921, page 497.
[2] JOURNAL, November, 1921, page 583.

of the distribution cost must be carried in some way by the meter rates. Some small part of it may be carried into the service charge, a large part may be carried as a loading on the cost of water per thousand gallons, going with all the water sold. But a substantial part of it will be carried by the higher steps of the sliding scale applying to the first quantities of water sold sufficient to cover this element of the cost.

This is a logical thing to do because it costs more per thousand gallons to distribute water to many small takers than to a few large ones. This is the reason for the sliding scale and it appears to be the only reason for the sliding scale that will stand critical examination.

The analysis of the whole problem, in which the capacity factor, borrowed from the electricians, has been given great weight, is interesting as a study, and it appears in the hands of the authors to have led to results that do not differ widely from those reached by the simpler analysis above outlined.

ALLEN HAZEN.[3]

DRINKING WATER AND DISEASE[4]

I have enjoyed thoroughly reading the very interesting article by Dr. H. E. Robertson upon the Relation of Drinking Water to Disease. I hesitate to criticise because of the possibility that our modern methods for purifying water supplies may destroy or eliminate substances which are useful or necessary to the human organism, although there is as yet little if any tangible evidence that such is the case.

The article is purely speculative in nature but contains a very important suggestion, namely, that we should begin to observe whether there may not be other important relationships of drinking water besides those of infectious diseases. A weak point in the article to my mind is the fact that we do not depend upon water to furnish us anything but water. We try to eliminate harmful substances, bacterial or chemical, but for dietary purposes we depend upon changes in the food ration to supply our deficiencies. The source of salts, minerals, or vitamines necessary to the human organism is food rather than water and the remedy for destruction or elimination of these lies in additions to supply food deficiency rather

[3] Consulting Engineer; Hazen, Whipple and Fuller, New York, N. Y.
[4] JOURNAL, January, 1922, page 46.

than tampering with the water. If iodine is deficient in certain water, it is probably only an index that it is probably deficient in the food products of the soil in such areas and this deficiency should be supplied in the food ration independent of water.

I quite agree with Dr. Robertson that some cognizance should be taken of the constituents of our finished product as delivered to consumers and that efforts should be made to determine what effects, if any, such finished products have upon the human organism, due to changes in the constituents effected by the processes of purification.

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